NTSB National Transportation Safety Board

Commercial Aviation: A Regulator/Industry Collaboration Success Story

Presentation to:

Modern Solutions Power Systems Conference

Name: Christopher A. Hart

Date: June 4, 2014

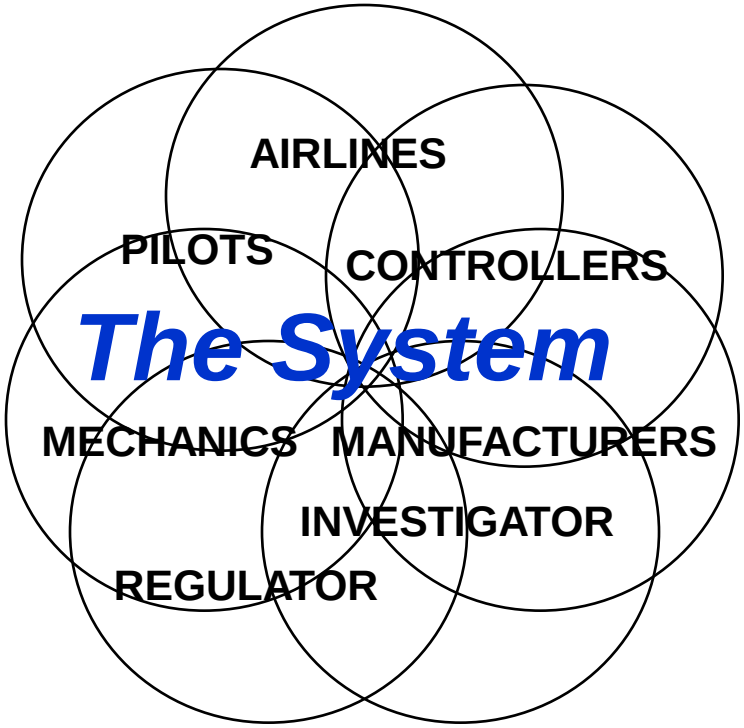
NTSB 101

- **Independent federal agency, investigate transportation mishaps, all modes**
- **Determine probable cause(s) and make recommendations to prevent recurrences**
- **Primary product: Safety recommendations**
  - **Favorable response > 80%**
- ***SINGLE FOCUS IS SAFETY***
- **Independence**
  - **Political: Findings and recommendations based upon evidence rather than politics**
  - **Functional: No "dog in the fight"**

The Context: Increasing Complexity

- **More System *Interdependencies***
  - – Large, complex, interactive system
  - – Often tightly coupled
  - – Hi-tech components
  - – Continuous innovation
  - – Ongoing evolution

- **Safety Issues Are More Likely to Involve *Interactions Between Parts of the System***



Effects of Increasing Complexity:

More "Human Error" Because

- System More Likely to be Error Prone
- Operators More Likely to Encounter Unanticipated Situations
- Operators More Likely to Encounter Situations in Which "By the Book" May Not Be Optimal ("workarounds")

The Result:

Front-Line Staff Who Are

- Highly Trained

- Competent

- Experienced,

-Trying to Do the Right Thing, and

- Proud of Doing It Well

. . . Yet They Still Commit

Inadvertent

Human Errors

Solution: System Think

Understanding how a change in one subsystem of a complex system may affect other subsystems within that system

“System Think” via Collaboration

Bringing all parts of a complex system together to collaboratively

- **Identify potential issues**
- ***PRIORITIZE* the issues**
- **Develop solutions for the prioritized issues**
- **Evaluate whether the solutions are**
  - **Accomplishing the desired result, and**
  - **Not creating unintended consequences**

Major Paradigm Shift

How It Is Now . . .

You are highly trained

and

If you did as trained, you would not make mistakes

so

You weren't careful enough

so

You should be PUNISHED!

How It Should Be . . .

You are human

and

Humans make mistakes

so

Let's *also* explore why the system allowed, or failed to accommodate, your mistake

and

Let's IMPROVE THE SYSTEM!

The Health Care Industry

To Err Is Human:

Building a Safer Health System

"The focus must shift from blaming individuals for past errors to a focus on preventing future errors by designing safety into the system."

Institute of Medicine, Committee on Quality of Health Care in America, 1999

Objectives:

Make the System

(a) Less Error Prone

and

(b) More Error Tolerant

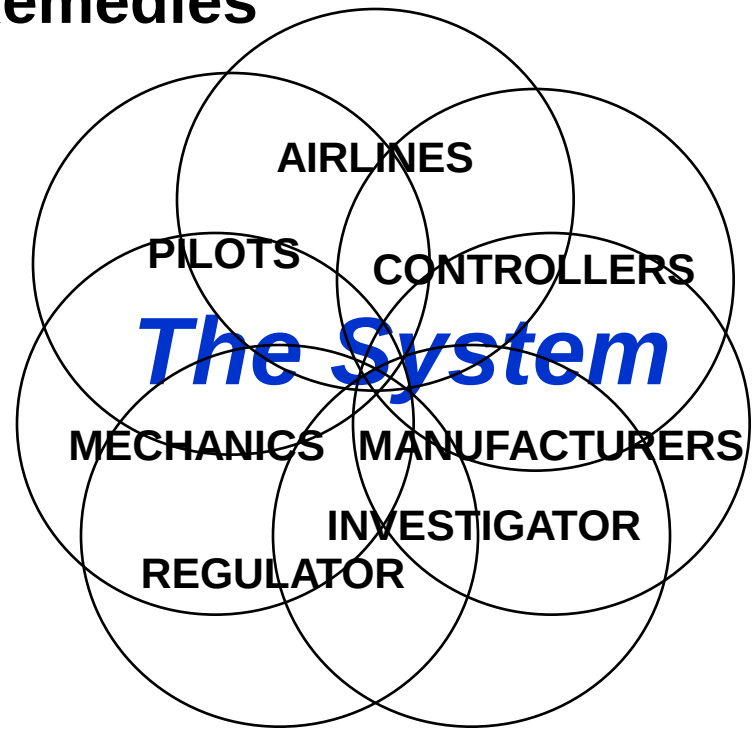
Evolution

- **Good ol' days: Accident investigations concluded with "human error"**
- **1990's: Accident investigators began looking beyond "human error" to consider the role of *corporate* safety culture in accidents and the role of corporate leadership in helping to create a positive safety culture**
- **Today: Accident investigators should also consider the role of *industry* safety culture in accidents and the role of the industry "leader," i.e., the regulator, in helping to create a positive industry safety culture**

Commercial Aviation Safety Team (CAST)

Engage *All* Participants In Identifying Problems and Developing and Evaluating Remedies

- Airlines
- Manufacturers
  - *With the systemwide effort*
  - *With their own end users*
- Air Traffic Organizations
- Labor
  - *Pilots*
  - *Mechanics*
  - *Air traffic controllers*
- Regulator



The Catalyst in Aviation

- **Mid-1990's, U.S. fatal commercial accident rate, although commendably low, had stopped declining**
- **Volume of commercial flying was projected to double within 15-20 years**
- **Simple arithmetic: Doubling volume x flat rate = *doubling of fatal accidents***
- **Major problem because public pays attention to the *number* of fatal accidents, not the *rate***

Collaboration Success Story

83% Decrease in Fatal Accident Rate, 1998 - 2007

largely because of

System Think

fueled by

Proactive Safety Information Programs

P.S. While safety was improved, *productivity was also improved!*

P.P.S. This process *did not generate a single new regulation!*

Moral of the Story

Anyone who is

involved in the *problem*

should be involved in

developing the *solution*

Safety/Productivity Success Stories

- **Ground Proximity Warning System**
  - ***S: Reduced warning system complacency***
  - ***P: Reduced unnecessary missed approaches, saved workload, time, and fuel***

- **Flap Overspeed**
  - ***S: No more potentially compromised airplanes***
  - ***P: Significantly reduced need to take airplanes off line for VERY EXPENSIVE (!!) disassembly, inspection, repair, and reassembly***

Another Paradigm Shift

- **Old: The regulator identifies a problem, develops solutions**
  - **Industry skeptical of regulator's understanding of the problem**
  - **Industry fights regulator's solution and/or implements it *minimally* and *begrudgingly***
- **New: Collaborative "System Think"**
  - **Industry involved in identifying problem**
  - **Industry "buy-in" re solution because everyone had input, everyone's interests considered**
  - **Prompt and willing implementation . . . *and tweaking***
  - **Solution probably more effective and efficient**
  - **Unintended consequences much less likely**
  - **May not necessitate new regulations**

Challenges of Collaboration

- **Human nature: "I'm doing great . . . *the problem is everyone else"***
- **Participants may have competing interests, e.g.,**
  - **Labor/management issues**
  - **May be potential co-defendants**
- **Regulator probably not welcome**
- **Not a democracy**
  - **Regulator must regulate**
- **Requires all to be willing, *in their enlightened self-interest,* to leave their "comfort zone" and think of the System**

The Role of Leadership

- **Demonstrate safety commitment . . .**
  but acknowledge that mistakes will happen
  (e.g., goal is *continuous improvement* rather than *more punishment*)
- **Include "us" (e.g., system) issues not just "you" (e.g., training) issues**
- **Make safety a middle management metric**
- **Engage labor early**
- **Include everyone with a "dog in the fight" -- manufacturers, operators, regulator(s) and others**
- **Encourage and facilitate reporting**
  - **Provide *feedback***
  - **Provide adequate *resources***
  - ***Follow through* with action**

How The Regulator Can Help

- **Demonstrate safety commitment**

(through goal of *continuous improvement* rather than *more punishment*)

- **Emphasize the importance of System issues *in addition to* *(not instead of)* worker issues**

- **Encourage and participate in industry-wide "System Think"**

- **Facilitate collection and analysis of information**
  - **Clarify and announce *policies for protecting information and those who provide it***
    - **Encourage other industry participants to do the same**

Safety Commitment at the Top

- **Organizational leaders must demonstrate commitment to safety for organization-level safety culture**
- **The industry "leader," i.e., the regulator, must demonstrate commitment to safety for industry-level safety culture**

Collaboration at Other Levels?

- **Entire Industry**
- **Company (Some or All)**
- **Type of Activity**
- **Facility**
- **Team**
- **Workplace**

Collaboration re Power Systems?

- **Select troublesome area**
  - **Nagging problem for many years**
  - **Many interventions have been tried, not successful**
  - **Likelihood that problems are systemic, not just people**
  - **Collaboration as effort to address the system problems**
  - **Less defensiveness because not focused on single event**
- **Select collaborative corrective action group**
  - **All who have a hand in the process**
  - **Manufacturers?**
  - **Operators?**
  - **Regulators?**
  - **Others?**

Conclusions

- ***Safety culture is important not only at the individual organization level, but also at the industry level***

- ***Organizational leaders must demonstrate commitment to safety for organization-level safety culture; and the industry "leader," i.e., the regulator, must demonstrate commitment to safety for industry-level safety culture***

- ***Safety programs that improve the bottom line are more likely to be sustainable***

- ***Collaboration can help generate safety programs that also improve productivity while improving safety***

Thank You!!!

Questions?